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Bright Ideas

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Program Highlight

Kokomo Center Schools
Kokomo, IN

Technology Education, Pre-Engineering, and Careers Meet at Kokomo Center Schools

Sharing a common campus, Kokomo Area Career Center (KACC) and Kokomo High School (KHS) are located approximately 50 miles north of Indianapolis in Kokomo, IN. With an enrollment in excess of 1,050 students, KACC serves students from three counties while offering 25 different programs, which prepare students with advanced high-demand technical skills for post-high school career choices. KHS, with an enrollment in excess of 2000 students, offers a well-rounded curriculum, including opportunities for students to enroll in Technology Education Department classes. KACC offers both traditional technology education courses and the nationally recognized Project Lead the Way (PLTW) program. The PLTW program seeks to increase the number of qualified high school students who complete a college engineering or engineering technology program. This broad spectrum of course offerings, along with a solid academic curriculum, provides a strong foundation for our students to build on for a successful post-high school life.

In 1993, the Indiana Industrial Education Association recognized Kokomo High School Industrial Arts Department for leadership in replacing the traditional industrial arts course offerings with the newer technology education curriculum. In 1998, the past superintendent of Kokomo-Center School became aware of a new and exciting pre-engineering



The team: Steve Rogers, Don Kunkle, Kelli McGregor, and Chris Byam.

program, Project Lead the Way. With 47% of Kokomo employment in the manufacturing industry, PLTW seemed a natural choice. After thorough investigation, including a visit to New York public schools to observe PLTW classes, the decision was made to offer the program course to Kokomo-Center students. Continuing with a tradition of leadership, the Kokomo-Center Schools immediately began the process of becoming one of the first systems to implement the PLTW program in Indiana.

PLTW's Gateway to Technology is offered in Kokomo's four middle schools. All students are required to take three units: Design and Mold Making, The Magic of Electronics, and The Science of Technology. Kokomo High school students may elect to enroll in the PLTW sequence of five courses. Classes offered are Introduc-

tion to Engineering Design, Principals of Engineering, Digital Electronics, Computer Integrated Manufacturing, and Engineering Design and Development.

In the fall of 2000, the Technology Education Department was shifted to the Kokomo Area Career Center. That fall, KACC offered the first PLTW course, Introduction to Engineering Design, to KHS students. Thirty-six students were enrolled in the class taught by Chris Byam. Students were selected based on strong math and science skills, along with an interest in engineering. Growing enrollment resulted in the addition of Digital Electronics and additional sections of Introduction to Engineering Design for the fall of 2001. Kelli McGregor and Don Kunkle joined the PLTW staff. Computer Integrated Manufacturing was added for the fall of 2002. Finally, the remaining two courses, Principles of Engineering and Engineering Design and Development, were offered in the fall of 2003. Joining the PLTW staff that year was Steve Rogers.

Pioneering Project Lead the Way in Indiana, Kokomo Center has been joined by more than 70 other schools in offering this highly innovative program. Currently, only 15 other high schools, along with KACC/KHS, qualify as Certified Pre-Engineering Technology Education programs. This certification allows our program to offer 12 credit hours towards enrollment at Purdue University in the School of Technology. These credits can be earned by taking up to four PLTW classes. According to Rogers, "The fact that we can offer college credits is a great recruiting tool that attracts students to our program."

Making our program unique is the offering of traditional technology education classes, along with the pre-engineering PLTW classes. The Indiana Department of Education recognizes both PLTW and technology education classes as certified Technology Education curriculum, which allows students to earn high school credit in these classes. Kokomo-Center Schools recognizes that the future of technology education at KACC/KHS involves both course offerings in the PLTW program for students with a pre-engineering



POE students are working with Fischertechnik parts to build a marble sorter.

interest and the technology education courses for students interested in pursuing other technical interests. With No Child Left Behind and the pursuit of higher academic standards, PLTW is an answer that will help our technology education program evolve with the needs of our community.

We are proud that the technology education courses, combined with the PLTW curriculum, allow all KHS students the opportunity to apply math, science, and other general education skills to real-world applications. Our technology education program currently offers classes in Manufacturing Systems, Manufacturing Processes, Construction Systems, Construction Processes, and Computers in Production and Design. Manufacturing Systems and Manufacturing Processes offers KHS students insight into the world of manufacturing, which opens new avenues to possible career choices. Many of these students will move into other KACC classes, like Machine Trades or Automotive Service Technology. Construction Systems and Construction Processes give KHS students an understanding of the world of construction. Many students continue on with Building Trades at the career center. The Computers in Production and Design courses give students the opportunity to explore all areas of our technology education curriculum. Students are introduced to CAD, robotics, and engineering applications.

The future of the technology education program at KACC/KHS looks bright. Currently we are working on a pilot program titled, "Building the Innovations Generation." This new program is a collaboration project between Rolls Royce, Indiana Department of Education, Project Lead The Way, Purdue University, Indiana Department of Workforce Development, and four other Indiana public schools. The goal is to involve industry in pre-engineering education.

It is not unusual for KHS students to be enrolled in PLTW, technology education, and KACC classes while building their well-rounded education. Some of these students will enter into engineering, the service industry, manufacturing, the automotive field, medical field, or numerous other professional careers. Whatever their choice, students who complete courses in KACC/KHS technology education classes will have a stronger foundation upon which to build their future.

If you would like to learn more about the Kokomo Area Career Center, visit www.kokomo.k12.in.us/kacc.

If you have an outstanding program that you would like to profile in a future issue of Bright Ideas, e-mail your request to iteacomm@iris.org.

Transportation Vehicles

Learning Activity

Introduction

Transportation is relocating goods and people from a point of origin to a destination. Modern transportation acts may involve individual or business travel, the intense competition of auto racing, or the launching of a solid-fuel rocket into earth orbit.

Moving people and goods occurs in one of the four environments: land, air, water (marine), or space. When the same vehicle travels in more than one medium, the term "intermodal transportation" is used.

Problem

Teams of students are challenged to design and build a vehicle capable of moving a standard-sized container through a specified environment. One or more groups may move their shipping container on water while other teams might move the unit using various land-based systems.

Teacher Preparation

1. Research the topic of "vehicular systems" by reviewing various Internet sites that address modern transportation.
2. Develop a formal presentation on transportation technology and the evolution of vehicle designs.
3. Gather the classroom and laboratory supplies necessary to conduct this activity.
4. Create a Vehicular Subsystems worksheet that lists the six transportation subsystems: propulsion, suspension, structural, guidance, control, and support.
5. Identify a large public area in the school to "test" the newly developed vehicles. An appropriate sign or poster about the activity would help introduce the activity to those who stop by to watch.

Conducting the Activity

1. Introduce the concept of transportation technology and its relationship to daily life.
2. Use a formal presentation to explain the technical subsystems common to all transportation equipment.
3. Distribute a copy of the Vehicular Subsystems worksheet.
4. Have the students: a) cut out the six signs from the sheet, b) select a toy

vehicle, c) tape the labels in their appropriate locations on the vehicles, and d) describe the six elements on the toy vehicle.

5. Divide the class into small groups.
6. Assign a specific transportation mode (or environment) to each team. Suggested challenges include: a deep, narrow waterway (or long sink); flat, dry area on a laboratory workbench; simulated hill; Maglev track; or steep incline (ramp).
7. Have the students: a) prepare a problem statement, b) identify the nature of the vehicle required for their intermodal challenge, c) determine the major "problems" likely to influence the success of their vehicles, and d) list the six technical subsystems that will be involved in their new vehicles.
8. Have each team determine what the vehicle should look like and how it will perform.
9. Have each team member: a) design a vehicle that meets the challenge, b) document the design through dimensioned sketches, and c) present the design to his or her team.
- 10) Have the team: a) review the designs presented by its members, b) select the best design, c) brainstorm ways to improve the selected design, d) document the new design through sketches and other means, e) participate in a demonstration of the relevant operation and safety for the tools and machines they will need to use, f) build a working model (prototype) of the vehicle, and g) test and demonstrate the vehicle.

Assessing Students

1. Have students define key terms related to the design and operation of modern vehicles.
2. Challenge the students to identify the six subsystems using sample vehicles or graphics on a worksheet.
3. Determine how well the new vehicles transport a container in a specific environment.
4. Use a quiz to determine whether students learned transportation concepts and terms during the activity.

The complete 19-page **HITS** (Humans Innovating Technology Series) technology activity, **Transportation Vehicles**, is available by ordering from ITEA at <https://tornado.he.net/%7Eitea/HitsKitsOnlineForm.html>. The complete ITEA Publications Catalog is available online at www.iteawww.org/F6.html.

ITEA Membership: What's in it for You?

Central Missouri State University's Technology Education Program is pleased to sponsor two CEU credits for those individuals registering and participating in the full ITEA Kansas City Conference, or 1 CEU for those registering for one day only. You must be registered for the conference in order to receive the credit.

The fee is \$20 for either one or two CEU credits. Enrollment forms will be available at the Registration area at the Conference. Payment can be made by cash, check, or credit card. Payment must be received on site. An official certificate will be mailed to the designated address on the enrollment form after the conference. The university will maintain a lifetime record of the CEU credit, and the registrant may receive one replacement copy of the certificate at no charge.

Graduate Credit

Full conference participants may also choose to receive two graduate credits at an \$80/credit hour tuition fee (\$160 total). This credit will be transcribed at the end of Spring semester, May 2005. To be eligible for this credit, the individual must be registered for and participate in the full conference. Enrollment forms will be available at the conference registration area.

To find out more about CEU credits at ITEA's Kansas City Conference, or the many additional member benefits, e-mail iteambrs@iris.org. To join today, go to <https://tornado.he.net/%7Eitea/MembershipApp.html>.